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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/580,446	05/23/2006	Yvonne Armitage	BT/3-22350/A/PCT	4199

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EXAMINER

AFREMOVA, VERA

ART UNIT	PAPER NUMBER
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1657

MAIL DATE	DELIVERY MODE
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12/11/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,446	Applicant(s) ARMITAGE ET AL.	
	Examiner Vera Afremova	Art Unit 1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>5/16/2008</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-11 as amended and new claims 12 (9/04/2008) are pending and under examination.

Deposit

Deposit requirement for the strain *Rhodococcus rhodochrous* NCIMB 41164 has been met in papers filed 9/04/2008.

Claim Objections

Claims 2 and 6 are objected to because of the following informalities:

Claims 2 and 6 appear to contain some typing errors. Appropriate correction is required.

Claim Rejections - 35 USC § 112

Indefinite

Claims 1-11 as amended are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is rendered indefinite by the phrase “residual fermentation broth components”. The nature, structure and/or meaning of these components are uncertain in the lack of definitions in as-filed specification.

Claim 2 recites “stired ub steo iii)”. The meaning of this phrase is uncertain.

Claim 6 recites the phrase "the comprised ...comprises" which meaning is uncertain, if not a typing error.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5 and 7-9 as amended and new claim 12 remain/are rejected under 35

U.S.C. 102(b) as being anticipated by US 5,705,382 (Endo et al).

Claims are directed to a method of producing an amide from the corresponding nitrile wherein the method comprises steps i) providing a microorganism capable of producing a nitrile hydratase biocatalyst, ii) culturing the microorganism in a growth medium, iii) storing the microorganism, iv) contacting the nitrile with the microorganism in an aqueous medium and thereby converting the nitrile to the amide, wherein the microorganism is stored as “none actively growing free” cells in a storage medium that comprises water. Some claims are further drawn to producing amide such as acrylamide. Some claims are further drawn to the use of same or different components in the growth medium and in the storage medium. Some claims are further drawn to the medium components being water, physiological saline, buffer or urea. Some claims are further drawn to the use of storage temperature being above the freezing point of the storage medium. Some claims are further drawn to the storage period for 2 days and more. Some claims are further drawn to the use of microorganism belonging to the genus of *Rhodococcus* or to the species of *Rhodococcus rhodochrous*.

US 5,705,382 (Endo et al) discloses a method of producing an amide from the corresponding nitrile (entire document including particular example 4 at col. 6-7) wherein the

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method comprises steps i) providing a microorganism belonging to the genus of *Rhodococcus* that is capable of producing a nitrile hydratase biocatalyst, ii) culturing the microorganism in a growth medium, iii) storing the microorganism, iv) contacting the nitrile with the microorganism in an aqueous medium and, thereby, converting the nitrile to the amide, wherein the microorganism is stored as a cell suspension or as “none actively growing free” cells in a storage medium that comprises water and/or phosphates. In the particular example 4, the microorganism is recovered from growth medium; both growth medium and storage medium comprises water and phosphates or physiological saline and/or buffer; the storage temperature is above the freezing point or 20 degree C; the storage period is about 100 days or more than 2 days (col. 7, lines 1-6). The cited patent also teaches that the microorganisms can be stored either as free cell suspension or as immobilized cells (col. 1, lines 54-65) in the method for producing amide. The cited patent also teaches producing amide such as acrylamide (col. 8, line 27). The cited patent also teaches the use of representative of the species of *Rhodococcus rhodochrous* (col. 2, line 37 or example 6) in the method for producing amide wherein the method comprises incorporation of urea in growth medium (col. 7, line 61) and storing cells as “non-actively growing” immobilized cells.

Thus, the cited method comprises identical steps and identical structural elements as required by the claimed method and, therefore, the cited patent US 5,705,382 anticipates the claimed invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-11 as amended and new claims 12 remain/are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,705,382 (Endo et al), Nagasawa et al (IDS reference. Pure and Appl. Chem. 1996, Vol. 67, No. 7, pages 1241-1256) and US 5,089,411 (Yamada et al).

Claims are directed to a method of producing an amide from the corresponding nitrile wherein the method comprises steps i) providing a microorganism capable of producing a nitrile hydratase biocatalyst, ii) culturing the microorganism in a growth medium, iii) storing the microorganism, iv) contacting the nitrile with the microorganism in an aqueous medium and thereby converting the nitrile to the amide, wherein the microorganism is stored as “none actively growing free” cells in a storage medium that comprises water. Some claims are further drawn to producing amide such as acrylamide or methacrylamide. Some claims are further drawn to the use of same or different components in the growth medium and in the storage medium. Some claims are further drawn to the medium components being water, physiological saline, buffer or urea. Some claims are further drawn to the use of storage temperature being above the freezing point of the storage medium. Some claims are further drawn to the storage period for 2 days and more. Some claims are further drawn to the use of microorganism belonging to the genus of *Rhodococcus* or to the species of *Rhodococcus rhodochrous* or to the use of particular strain *Rhodococcus rhodochrous* NCIMB 41164.

The cited patent US 5,705,382 (Endo et al) is relied upon as explained above for the disclosure of a method for producing amides from the corresponding nitriles (entire document including particular examples 4 and 6) wherein the method comprises steps culturing

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microorganisms belonging to the genus of *Rhodococcus* including representatives of the species of *Rhodococcus rhodochrous* in a growth medium, storing the microorganisms in a storage medium and converting nitriles to amides by using enzymatic activity of microbial cells after prolonged storage at temperature above freezing point.

The cited patent US 5,705,382 is lacking particular disclosure about the use of specific strain *Rhodococcus rhodochrous* NCIMB 41164. However, it discloses another strain *Rhodococcus rhodochrous* such as strain J-1 (col. 7, line 59) that is capable for producing both acrylamide (col. 8, line 27) and methacrylamide (see Nagasawa et al. at page 1248, lines 8-15) and that retains enzymatic activity after prolonged storage at temperature above freezing (col. 8, line 14 and table 6).

Although in the particular example *Rhodococcus rhodochrous* strain J-1 is immobilized before storage, the cited patent US 5,705,382 clearly teaches that microbial cells having nitrile hydratase including representatives of the genus *Rhodococcus* activity can be stored either as free cell suspensions or as immobilized cells (col. 1, lines 54-65) in the method for producing amide (examples 4 and 7).

The cited patent US 5,705,382 also teaches incorporation of urea in the culture medium for *Rhodococcus rhodochrous* (col. 7, line 61). Further, US 5,089,411 (Yamada et al) is relied upon for the explicit teaching that incorporation of urea and its derivatives increases enzymatic activity of *Rhodococcus rhodochrous* (entire document including abstract).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to use *Rhodococcus rhodochrous* cells stored as free cell suspensions and to use urea in the culture media of *Rhodococcus rhodochrous* in the US

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5,705,382 with a reasonable expectation of success in producing amide because the prior art teaches that microbial cells retain their having nitrile hydratase activity when stored either as free cell suspensions or as immobilized cells and because incorporation of urea and its derivatives increases enzymatic activity of *Rhodococcus rhodochrous*. Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

The substitution of one strain for another microbial strain is considered to be substitution of equivalents in the instant case wherein the prior strain J-1 belongs to the same species and capable to produce amide after storage as the claimed strain NCIMB 41164. Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

The claimed subject matter fails to patentably distinguish over the state art as represented by the cited references. Therefore, the claims are properly rejected under 35 USC § 103.

Response to Arguments

Applicant's arguments filed 9/04/2008 have been fully considered but they are not persuasive.

With regard to the claim rejection under 35 U.S.C. 102(b) as being anticipated by US 5,705,382 (Endo et al) applicants' main argument is that the cited method encompasses collecting cells by centrifugation and re-suspending the cell pellet in a buffer; thus, the cited method would not teach storing cells in the presence of "residual fermentation broth components". This argument does not appear to have persuasive grounds for the very least reason that the "fermentation broth components" in the light of as-field specification are typical

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ingredients of microbial medium that include inorganic salts (page 8, lines 2-6) and the inorganic salts are common components of buffer.

With regard to the claim rejection under 35 U.S.C. 103 applicants' argument that the cited patents teach incorporation of urea into a culture medium rather than into a storage medium does not appear to have persuasive grounds for the very least reason that the claim 6 is indefinite and, thus, it does not clearly points the use of urea. Further, it would be reasonably to conclude that at least some traces of urea would be "residual" components of a fermentation medium upon cell transfer to a storage medium.

Applicants also argue that the cited references are silent about the use of specific strain NCIB 41164. However, the substitution of one strain for another microbial strain is considered to be substitution of equivalents in the instant case wherein the prior strain J-1 belongs to the same species and capable to produce amide after storage as the claimed strain NCIMB 41164. Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

No claims are allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after

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the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Afremova whose telephone number is (571) 272-0914. The examiner can normally be reached from Monday to Friday from 9.30 am to 6.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon P. Weber, can be reached at (571) 272-0925.

The fax phone number for the TC 1600 where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology center 1600, telephone number is (571) 272-1600.

Vera Afremova

AU 1657

December 5, 2008

VERA AFREMOVA

PRIMARY EXAMINER

/Vera Afremova/
Primary Examiner, Art Unit 1657